National Charter School

Resource Center

at American Institutes for Research

Welcome to the Webinar!

Learning More About Green Charter Schools: Exploring Successful Models and Financing Options

We will be starting soon.





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Resource Center

at American Institutes for Research

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August 23, 2012





About the Resource Center

The **U.S. Department of Education** is committed to promoting effective practices, providing technical assistance, and disseminating the resources critical to ensuring the success of charter schools across the country. To that end, the Education Department, under a contract with American Institutes for Research, has developed the **National Charter School Resource Center**.

Presenters

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Director and General Counsel Pacific Charter School Development



Learning More about Green Charter Schools: Exploring Successful Models & Financing Options



Jennifer Afdahl Rice | NCB Capital Impact





- Introductions
- What is a Green Building?
- Green Design
- Green Financing Options
- Case studies
- Q & A







- Financing charter schools for 18 years
- \$555 million
- 200,000 charter school seats nationwide
- NCB Capital Impact is the largest Community Development Financial Institution (CDFI) charter school lender.



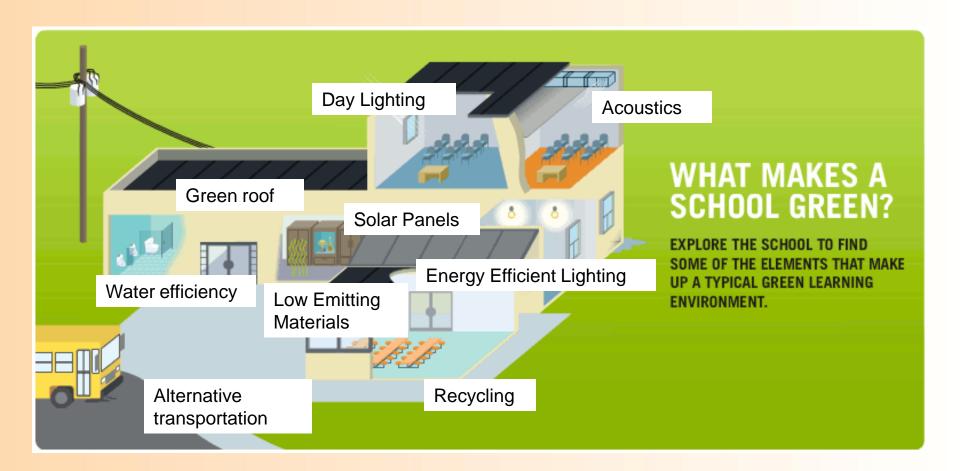
green school

\grEn skül \n.

a school building or facility that creates a healthy environment that is conducive to learning while saving energy, resources and money



Green School Elements



Courtesy of USGBC Center for Green Schools http://centerforgreenschools.org





Characteristics of a Green School

- Conserves energy and natural resources
- Improves indoor air quality
- Removes toxic materials from places where children learn and play
- Employs daylighting strategies and improves classroom acoustics
- Employs sustainable purchasing and green cleaning practices
- Improves environmental literacy in students





Characteristics of a Green School (cont.)

- Decreases the burden on municipal water and wastewater treatment
- Encourages waste management efforts to benefit the local community and region
- Conserves fresh drinking water and helps manage stormwater runoff
- Encourages recycling
- Promotes habitat protection
- Reduces demand on local landfills

Source: USGBG





Roof-mounted solar panels



Alternative energy source provides savings

Green roof



Energy savings & filter storm water run-off

White roof



Energy savings





- Acoustical ceiling tiles
- Lined ductwork
- HVAC systems with properly placed vents

Benefits

More productive learning environment, allow teachers to be heard





Benefits

- Skylights
- Large windows
- Adjustable blinds & shades

Lightshelves

Reduced energy costs, reduced glare, even light distribution, improved student concentration and performance





The Heschong Mahone Daylighting Study (PDF) of more than 21,000 students showed a dramatic correlation between daylit school environments and student performance, including:

- 20% faster progression in math.
- 26% faster progression in reading.
- Views out of windows increased performance by 5-10%.

http://www.coe.uga.edu/sdpl/research/daylightingstudy.pdf





- Low VOC paint and carpet adhesives
- Ceiling tiles, wall systems and furniture constructed with non-toxic materials

Benefits

Improved air quality reduces absences related to respiratory conditions





- Students in America miss approximately 14 million school days per year because of asthma*
- Controlling exposure to indoor environmental factors, such as carbon monoxide, dust, and pollen, could prevent more than 65 percent of asthma cases among elementary school-age children**
- More than 20 percent of public schools reported having unsatisfactory indoor air quality***

*US Center for Disease Control

**American Journal of Respiratory & Critical Care Medicine

***US Department of Education



air that is unfit to breathe

AFT's 2008 Building Minds Minding
Building report cites a GAO study showing
15,000 U.S. schools suffer from indoor air
that is unfit to breathe.

THOUSAND



- Low-flow sinks
- Waterless urinals
- Dual-flush toilets

Benefits

- Rain water catchment
- Grey water tanks

Water conservation, reduced costs, lower burden on municipal water system





- Solid waste recycling programs
- Rainwater catchment & recycling
- Composting

Benefits

Cost savings, reduced impact on municipal services, reduced reliance on landfills, energy savings

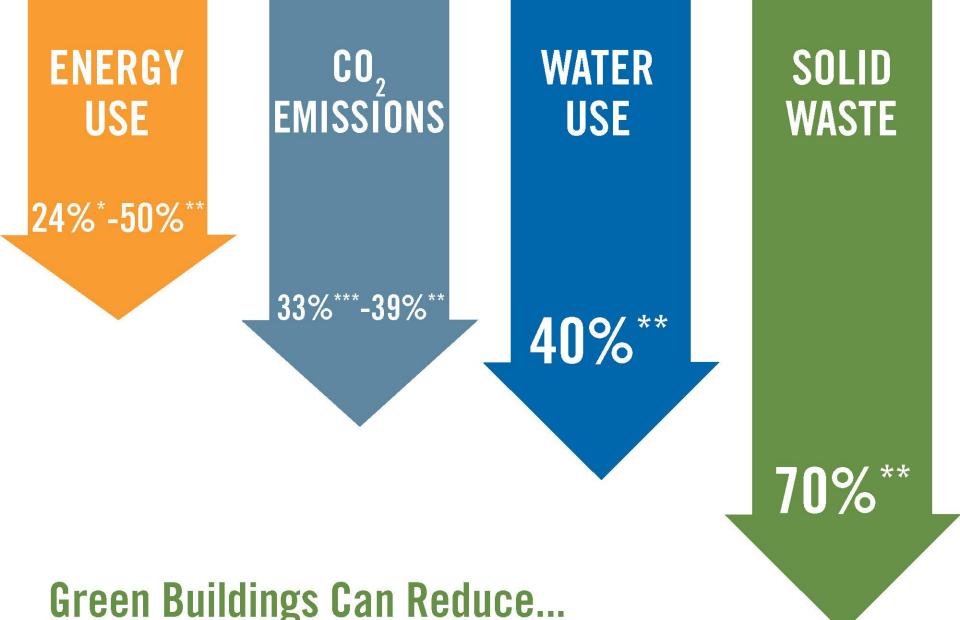




__ LEED Checklist

北北北目	2009 for Schools New Construct Checklist	iction and major K	enovation			Proj	ject Nan Da
3 7 Sustai	nable Sites	Possible Points: 24	ΥN		als and Resources, Continued		
N ? Prereq 1	Construction Activity Pollution Prevention		1 1	1 Credit 3	Materials Reuse		1 to 2
Prereq 1	Environmental Site Assessment		1	1 Credit 4	Recycled Content		1 to 2
Credit 1	Site Selection	1	1	1 Credit 5	Regional Materials		1 to
Credit 2	Development Density and Community Connec	tivity 4		1 Credit 6	Rapidly Renewable Materials		1
1 Credit 3	Brownfield Redevelopment	1		1 Credit 7	Certified Wood		1
	Alternative Transportation—Public Transporta	ation Access 4					
	Alternative Transportation—Bicycle Storage a		9 4	6 Indoor	Environmental Quality Po	ssible Points:	19
	Alternative Transportation—Low-Emitting and	490 35 BERNEY - 100 TO BERNEY - 100 BERNEY -	7 7	o middoi	Livinoimiental Quality 10.	Jaible Follies.	12
	Alternative Transportation—Parking Capacity		Y	Prereq 1	Minimum Indoor Air Quality Performance		
	Site Development—Protect or Restore Habita		Y	Prereq 2	Environmental Tobacco Smoke (ETS) Control		
	Site Development—Maximize Open Space	1	Y	Prereq 3	Minimum Acoustical Performance		
	Stormwater Design—Quantity Control	1	1	Credit 1	Outdoor Air Delivery Monitoring		1
	Stormwater Design—Quality Control	1		1 Credit 2	Increased Ventilation		1
	Heat Island Effect—Non-roof	1	1	75 Distriction	Construction IAQ Management Plan—During Constru	ection	1
	Heat Island Effect—Roof	1	1	Credit 3.2			1
Credit 8	Light Pollution Reduction	1	4	Credit 4	Low-Emitting Materials	ricy	1 to
1 Credit 9	Site Master Plan	1	1	Credit 5	Indoor Chemical and Pollutant Source Control		1
Credit 10		,	1		Controllability of Systems—Lighting		1
Credit 10	Joint Ose of Facilities	31		_	Controllability of Systems—Eighting Controllability of Systems—Thermal Comfort		1
1 6 Water	Efficiency	Possible Points: 11	1		Thermal Comfort—Design		1
1 0 Water	Liffciency	rossible rollits.	1		Thermal Comfort—Verification		1
Prereg 1	Water Use Reduction—20% Reduction		100	3 Credit 8.1			1 to
Prereq 1	Water Ose Reduction 20% Reduction Water Efficient Landscaping	2 to	4	- Contraction	Daylight and Views—Views Daylight and Views—Views		1 10
2 Credit 2	Innovative Wastewater Technologies	2 10	1	Credit 9	Enhanced Acoustical Performance		1
2 Credit 2	Water Use Reduction	2 to	-	Credit 10	Mold Prevention		1
1 Credit 3	Process Water Use Reduction	1	4	Credit 10	Mold Prevention		3
Credit 3	Process water ose reduction	1	4	2 Innova	tion and Design Process Po	ssible Points:	6
6 Energ	y and Atmosphere	Possible Points: 33				Jointe Tomes	
			1	Credit 1.1	Innovation in Design: Specific Title		1
Prereq 1	Fundamental Commissioning of Building Energ	gy Systems			Innovation in Design: Specific Title		1
Prereq 2	Minimum Energy Performance		1	Credit 1.3	Innovation in Design: Specific Title		1
Prereq 3	Fundamental Refrigerant Management			1 Credit 1.4	Innovation in Design: Specific Title		1
Credit 1	Optimize Energy Performance	1 to	19 1	Credit 2	LEED Accredited Professional		1
Credit 2	On-Site Renewable Energy	1 to	7 1	Credit 3	The School as a Teaching Tool		1
2 Credit 3	Enhanced Commissioning	2	2		···		
Credit 4	Enhanced Refrigerant Management	1	3	1 Region	nal Priority Credits Po	ossible Points:	4
2 Credit 5	Measurement and Verification	2			2 10 19/20 10 20 16/2 × 40		
2 Credit 6	Green Power	2	1	Credit 1.1	Regional Priority: Specific Credit		1
			1	Credit 1.2	Regional Priority: Specific Credit		1
	ials and Resources	Possible Points: 13	1	Credit 1.3	Regional Priority: Specific Credit		1
3 5 Mater					Barrier I Britain Caracter Caratte		4
3 5 Mater				1 Credit 1.4	Regional Priority: Specific Credit		1
3 5 Mater	Storage and Collection of Recyclables			33 Total	Regional Priority: Specific Credit		1





* Turner, C. & Frankel, M. (2008). Energy performance of LEED for New Construction buildings: Final report.

** Kats, G. (2003). The Costs and Financial Benefits of Green Building: A Report to California's Sustainable Building Task Force.

*** GSA Public Buildings Service (2008). Assessing green building performance: A post occupancy evaluation of 12 GSA buildings.





Greening America's Schools Costs and Benefits

http://www.michigangreen.org/energynews/GreeningAmericasSchools-GregoryKats.pdf

- Database of State Incentives for Renewables and Efficiency (DSIRE) http://www.dsireusa.org
- EnergySmart Schools, U.S. Department of Energy Guide to Financing EnergySmart Schools
- Energy Service Performance Contracts: National Association of Energy Service Companies http://www.naesco.org
- The Sustainable Answer Key www.ncbcapitalimpact.org









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Low Income Investment Fund

Green Charter Schools:
Exploring Successful Models
and Financing Options









Agenda

- Introductions
- What is a Green Building?
- Green Design
- Green Funding Options
- Case studies
- Q & A



About LIIF

LIIF is a leading national community development lender with a mission of poverty alleviation. Since its founding in 1984, LIIF has invested \$1 billion in strategies that support healthy families & communities.



LIIF's Programs

POLICY

Housing

Child Care

Education

Foods

TOD

Green

Stories of Success







LIIF & Charter Schools

- Invested more than \$285 million in high-performing schools
- Created / improved 58,000 spaces for students
- Generate over \$746 million in increased earning potential for youth.



Green Funding Options

- Debt
 - Targeted Green Financing Products
 - Traditional Facilities Financing
- Grants, Rebates & Incentives
- Energy Savings Performance Contracts, Leasing Arrangements & Power Purchase Agreements



Debt: Targeted Green Financing Products

Targeted lending products to support energy retrofits or the incorporation of green elements to existing facilities.



Debt: Targeted Green Financing Products

LIIF's Green Opportunity (GO) Fund

- An innovative effort to improve energy and water efficiency in charter schools
- Provides free energy audit, technical support, and favorably termed debt
- Located in Los Angeles



GOALS of the GO Fund Pilot

1. Improve property cash flow

Identify ways to save the maximum amount of energy and water at a property as cost efficiently as possible

2. Improve health of buildings and occupants

More natural day light, better indoor air quality, and use of sustainable and healthy materials

3. Reduce greenhouse gas emissions

Attain a 20% overall reduction in energy use and costs

4. Data Collection

Analyze pre-retrofit energy usage, monitor implemented energy measures post-retrofit, and collect data that will demonstrate how savings are achieved



GO Fund Loan Terms

✓ Fund Size

\$3 million

✓ Loan Size

Up to \$250,000

✓ Interest Rate

5%

✓ Loan Term

Up to 10 years

Loans repaid with savings achieved as a result of the energy and water efficiency improvements.



Debt: Traditional Facilities Financing

The inclusion of green / energy efficiency elements in the construction or renovation of a charter school facility.



Debt: Traditional Facilities Financing

- Construction Loans
 - Interest-only, 6 18 month terms, capitalized interest
- Permanent Loans
 - Longer Term (7 10 years), Max Loan-To-Value, Amortizing
- Leasehold Improvement Loans
 - Term matches Lease, Leasehold mortgage / lease assignment
- Tax Exempt Bonds
 - Larger deal sizes, more complex structure



CDFI Lenders Supporting Green

- Low Income Investment Fund (LIIF)
- NCB Capital Impact
- Nonprofit Finance Fund (NFF)
- Local Initiatives Support Corporation (LISC)
- Self-Help
- The Raza Development Fund, Inc. (RDF)
- The Reinvestment Fund



Grants, Rebates & Incentives

- Government
 - Federal, State, County, City
- Utility Companies
- Non-profits / Foundations
 - Bill & Melinda Gates Foundation,
 Environmental Grantmakers Association



State Aid

- Can be funding from the Clean Air Act State Implementation Plan Budgets, Lawsuit Proceeds, Energy Portfolio Standards, System Benefit Trust Funds
- Often administered through state energy agency
- Example: Massachusetts Technology Collaborative (MTC) Renewable Trust
 - Up to \$350k in grants to install solar electric, wind electric or other clean energy technologies



Incentives on Equipment Purchases, Energy Efficient Designs

- Can reimburse capital costs of equipment or labor
 - Example: Efficiency Vermont (state energy agency) and the School Energy Management Program offer incentives to schools to upgrade lighting, HVAC and cooler systems
- Can offset up-front investment costs to design & commission a school
 - Example: New Hampshire High Performance School Incentive allows districts that design according to Northeast Collaborative for High Performance Schools Protocol to receive up to 3% reimbursement



Utility Companies

- Savings By Design, California's nonresidential, new construction energy efficiency program
 - Incentives can vary by project and range from \$500 to \$150,000
 - Must be a customer of participating Utility company to qualify:
 PG&E, SDG&E, SCE, SoCalGas, SMUD



Financing a Green Facility: What is Green?

Green: projects or practices that use sustainable, more renewable materials and methods

Green Project ≠ \$\$ Savings

Energy: projects or behaviors that save or eliminate energy consumption and as a result

Energy Projects = \$\$ Savings



Financing a Green Facility: Start with good due diligence

Develop a Baseline

- Identify all Energy using components at the property
- Rank components in order of Payback

Evaluate Opportunities for Other Green Components

- Low VOC paints, sealants, caulking
- Green Cabinets and floor coverings



Best Charter School Energy Opportunities

(Data provided by EMG)

- High efficiency HVAC
- Controls on HVAC
- Lighting controls
- Natural Light/Shading
- Point of use hot water heater
- Solar hot water heating
- Turn off office equipment
- Offsite food preparation

	orisite rood preparation
•	Incentivize cleaning / custodial crew as energy monitors

System	Percent Annual Energy Usage		
HVAC	56%		
Lighting	17%		
Water Heating	7 %		
Office Equipment	12%		
Onsite Cooking	6%		
Other	2%		



Where Does the Energy Savings Come From?

Best Payback component at charter schools (Data provided by EMG)

<u>Components</u>	Actual Savings
CFL Light Bulbs (Interior)	42%
Refrigerator	40%
Low Flow Toilets	38%
Shower Heads	32%
HVAC Split System	34%
Faucet Aerators	33%

^{*}Based on Green v. Existing component usage, 84 Public and Charter K-12 Schools



Financing a Green Facility: Energy Benchmarking

- Hard to manage what you don't measure
- Identifies energy opportunities
- Baseline analysis of energy consumption /cost
- Provides metric to measure and compare energy usage



Financing a Green Facility: Energy Audits

Three Levels of Energy Audits

Level I - Walk-through Analysis Level II - Energy Survey and Analysis Level III – Detailed Analysis of Capital-Intensive Modifications

- Detailed review of all energy consuming components
- System improvements to lower energy usage -Energy Conservation Measures (ECM)
- Ranks ECMS based on Savings to Investment Ratio (SIR)



Financing a Green Facility: Energy Planning & Implementation

- Prioritize opportunities and budget
 - Recommend viable candidates for renewable energy, solar, wind, geothermal, combined heat power (CHP)
- Explore project based incentives and grants available
- Internal guidance for the implementation of Energy Plan
 - > Energy Training and Awareness Program for stakeholders
- Outline process for measuring and verifying savings





A Developer's Perspective on Building Green





A Case Study:
Animo Pat Brown Charter High School
8255 Beach Street, Los Angeles, CA 90001

Animo Pat Brown Charter High School is operated by Green Dot Public Schools



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Overview of Pacific Charter School Development, Inc.

- PCSD is a California based non-profit developer of facilities for charter schools
- PCSD was established to address a central hurdle in the establishment of charter schools—the availability of quality facilities
- PCSD finds, finances, and builds facilities and then leases these campuses to its charter school clients
- PCSD's goal is to sell the developed campus to its client so that it can recycle its philanthropic equity into other projects and thus create more seats
- To date, PCSD has created 16,306 new charter school seats for California's leading charter school operators



Why build a Green Project?

- It's the right thing to do...and you will be imparting these values to the next generation of leaders. Global, regional and direct benefits.
- Jurisdictions are mandating green building practices.
- May assist in fundraising efforts.
- May assist in recruiting efforts.
- May be used as a tool in your curriculum to illustrate scientific/math principles.
- You may already be contemplating incorporating many green elements in your facility plans. Some examples:
 - Adaptive Reuse—traditionally PCSD's projects have been adaptive reuses of existing buildings that have outlived their usefulness for other purposes
 - Daylighting
 — Maximizing natural light penetration by either punching holes in walls to create windows or putting skylights in.



Project Summary for Animo Pat Brown

Architect: Berliner and Associates Architecture

General Contractor: Blackwell Construction

Seats Created: 570

Total Building Size: 40,099 sq ft

Total Property Size: 2.01 acres

Total Project Cost: \$11.4 M

Hard costs: \$6 M

Project Manager: Patrick Ontiveros

LEED Certification: LEED Silver. First High School in California to

achieve LEED Silver certification.



What is the cost premium for doing a LEED certified building?

Before this project was completed anecdotal evidence suggested that the cost premium is on average 15%. However, the premium for doing a silver LEED certified project at Beach Street was about 5%. See chart.

"Most trade contractors are already working at [the] Silver level. The cost is between 0 - 5% depending on the point selection items by the project team."
--Javan Nabili, gkkworks

Soft Costs		
USGBC Registration	\$	450.00
USGBC Design Review	\$	1,250.00
USGBC Construction Review	\$	500.00
Commissioning Agent	\$	43,799.35
Additional Architecture & Engineering Fees	\$ \$ \$ \$	34,000.00
Green Power Purchase	\$	1,665.00
Subtotal	\$	81,664.35
Hard Costs		
Waterless Urinals (Premium)	\$	8,000.00
High Efficiency HVAC Units (Premium)	\$	70,000.00
Certified Wood (Premium)	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	15,000.00
Doors	\$	1,184.00
Recycled Materials for Use in Bathrooms	\$	20,000.00
Shower in One of the Bathrooms	\$	3,500.00
Bike Racks	\$	5,000.00
Low Emitting Materials (Premium)	\$	5,000.00
HVAC LEED Certification Testing Work	\$	24,700.00
Duct Silencers	\$	95,070.00
Stormwater Treatment Tank System	\$	31,160.00
Subtotal	\$	278,614.00
TOTAL	\$	360,278.35
AS % OF TOTAL PROJECT COST (\$11.45 M	3.15%	
AS % OF TOTAL HARD COST (\$6 M	4.64%	



The LEED Rating System for Schools

The LEED Rating System for Schools is broken into 7 sections:

- 1. Sustainable Sites
- 2. Water Efficiency
- 3. Energy & Atmosphere
- 4. Materials and Resources
- 5. Indoor Environmental Quality
- 6. Innovation in Design Process
- 7. Regional Priority

Note that the rating system is not only concerned with the design features that are incorporated into the final project but also with the construction process and how the project is operated and maintained. This is true for both LEED and CHPs.



Examples of LEED Features at Animo Pat Brown

SUSTAINABLE SITES:

 Measures to reduce automobile use—installation of bicycle racks, preferential parking for low emitting/fuel efficient vehicles and carpools

WATER EFFICIENCY:

Drought resistant landscaping results in 71.8% reduction in water consumption

ENERGY & ATMOSPHERE:

 Installation of systems that maximize energy efficiency—HVAC, lighting and water systems

MATERIALS & RESOURCES:

- Recycling collection and storage on site is part of operations and maintenance
- Adaptive reuse of an existing building

INDOOR ENVIRONMENTAL QUALITY:

- No smoking allowed on any part of the campus—both during and after construction
- Maximized interior daylighting through use of skylights and windows

INNOVATION IN DESIGN:

Green housekeeping—only low impact cleaning products and equipment are used

57



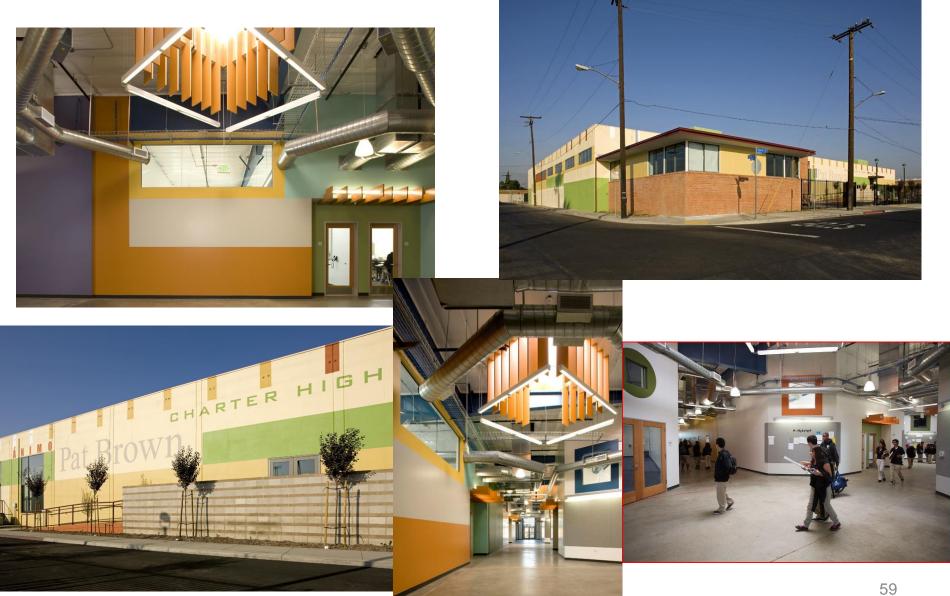


8255 Beach Street before it was developed as a charter school campus





Animo Pat Brown Charter High School





Another PCSD Green Project

Ánimo Ralph Bunche Charter High School &

Ánimo Jefferson Charter Middle School

Architect: John Friedman Alice Kimm Architects

General Contractor: Del Amo Construction

Seats Created: 1,120

Total Building Size: 77,173 sq ft

Total Property Size: 1.93 acres

Project Cost: \$22.3 M

Project Managers: Megan Hadden & Pete Kyriacou

LEED Certification: Achieved LEED certified status in

November 2009

First high school in California to achieve

the LEED for Schools Certification!!!

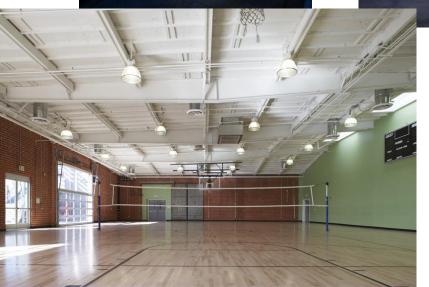


East 27th Street - Animo Ralph Bunche & Animo Jeffers













Lessons Learned

Plan early

- ➤ Determine whether you can afford the added cost.
- There may be long lead times for some products.
- ➤ Some LEED credits may be hard to achieve and your time may be better spent on other credits for example, MR Cr-Regional Materials
- Some LEED credits may be too expensive for the number of points achieved



Lessons Learned

Hire a contractor who has worked on green buildings.

- ➤ If you hire a GC who has already gone through the process, it makes life easier.
- ➤ If you hire someone who has not gone through the process, things become more complicated, but not impossible.
- ➤ Make sure that your construction contract explicitly states that the contractor is to deliver a LEED certified building (the standard AIA contract does not include this).



Lessons Learned

Hire an architect who has worked on green buildings. If you are doing a LEED project, hire someone who is a LEED accredited professional (AP).

- Try to find someone who has a demonstrated history of balancing green features with cost. It is easy to overdesign if you are not careful.
- Make sure that at the outset your contract with your architect explicitly states that they are to deliver plans and specs for a LEED project (the standard AIA contract does not include this).



Additional Resources:

<u>www.usgbc.org</u> and <u>www.greenschoolbuildings.org</u> <u>www.chps.net</u>

For California State:

www.green.ca.gov/default.htm

For Los Angles City and County:

www.green.lacounty.gov

www.environmentla.org

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Questions?



Raise your hand or enter your question in the chat box on the left side of your screen.

Thank you for participating.

- This webinar will be archived at the following website:
 - http://www.charterschoolcenter.org/webinars/
- Please share your feedback with us through the evaluation.

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